

Applicants: Hirvonen et al.
Application Serial No.: 10/538,193
Filing Date: April 21, 2001
Docket No.: 187-95 PCT/US
Reply to Final Office Action mailed July 10, 2008
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REMARKS

The final Office Action mailed July 8, 2008 and the references cited therein have been carefully considered. The claims have been amended in an effort to further clarify that which the Applicants regard as the invention.

Support for this Amendment is generally found within the specification, claims, and drawings, as originally filed. As a result of this Amendment taken together with the remarks set forth below, it is respectfully submitted that pending Claims 1-23 are now before the Examiner in condition for favorable consideration and allowance.

A. Claim Rejections under 35 U.S.C. §103

Claims 1-23 were rejected as obvious over U.S. Patent No. 6,188,365 to Mattsson et al. (*Mattsson*) in view of U.S. Publication 2002/0127971 to Chen et al. (*Chen*).

The present invention is directed to an arrangement for testing a radio device, which includes a waveguide and a holder. The waveguide is closed at both of its ends. The holder is arranged to hold the radio device partly inside the waveguide in such a manner that at least a portion of the radiating part of the radio device remains outside the waveguide. The at least a portion of the radiating part of the radio device remaining outside the waveguide is entirely inside the holder. The waveguide includes one or more ridges and one coupling. The ridges extend along a longitudinal axis of the waveguide, and the end of at least one ridge facing the holder is beveled. The coupling is inside the waveguide for transmission and reception of a radio-frequency signal by the use of a wideband mode of propagation, as now defined by amended Claim 1.

The present invention is further directed to a method of testing a radio device wherein the radio device to be tested is mounted by means of a holder such that the radio device is held partly

inside a waveguide closed at both of its ends. The method includes generating a wideband mode of propagation in the waveguide by means of at least one ridge. The end of the at least one ridge facing the holder is beveled. The method also includes transmitting and receiving radio-frequency signals by using the wideband mode of propagation between the radio device and a coupling installed in the waveguide. At least a portion of the radiating part of the radio device remains outside the waveguide. The at least a portion of the radiating part of the radio device remaining outside the waveguide is entirely inside the holder, as now defined by amended Claim 17.

It is submitted that nothing in *Mattsson* would teach or suggest a beveled ridge. Further, nothing in *Chen* suggests that the antenna-receiving member functions as a waveguide, i.e. that it confines and directs radio waves in a direction determined by its physical boundaries, as required by Claims 1 and 17. In fact, Fig. 14 of *Chen* shows an embodiment with an open antenna-receiving member that could not function as a waveguide, and there is no indication that this change would have any effect on the operation of *Chen*'s device.

Claims 1 and 17 also require that a portion of the radiating part of the radio device remains outside the waveguide, and that the portion remaining outside is entirely inside the holder. Assuming for the sake of argument that the antenna-receiving member of *Chen* could function as a waveguide, *Chen* nonetheless fails to disclose a holder as described above. The holder of *Chen* is clearly configured to place the entire radiating part (i.e. the antenna) inside the antenna-receiving member. *See, e.g., Chen* [0029]. The antenna-receiving member is the only enclosed feature of *Chen*'s apparatus, so any part of the radio device remaining outside of the antenna-receiving member cannot in any sense be "entirely inside the holder".

Claim 2 describes "one or more pegs, made from a conductive substance and fastened to the inner surface of the waveguide." The Office Action indicates that *Mattsson* teaches such pegs at col. 4 lines 1-6. However, the cited text only mentions that the end of the waveguide is

“covered by a material 25 that will absorb the power” of the test signal. Neither the text nor Fig. 3 of *Mattsson* suggests that this material would be in the form of pegs.

Similar arguments apply to Claims 3, 4, and 22, which also involve pegs. Further, Claim 4 specifies that “one end of at least one peg is fastened to the same wall of the waveguide as one ridge”. Since the embodiment described in the citation from *Mattsson* contains no ridges, *Mattsson* cannot disclose this feature. The Office Action relies on the same text from *Mattsson* in the rejection of Claim 6, which involves strips of absorption material. Once again, however, nothing in *Mattsson* suggests that the material described therein would be in the form of strips.

Regarding Claim 7, the Office Action indicates that *Mattsson* discloses an arrangement “wherein the cross-sectional shape of the holder conforms to the external dimensions of the radio device to be tested and that the length of the holder is selected in a manner preventing radio-frequency radiation from propagating out from the end of the holder opposite to the waveguide” at col. 2 lines 38-46 and col. 3 lines 10-17. However, it is submitted that the cited text merely describes general dimensions of the waveguide in *Mattsson*, and does not mention any particular method or rationale for selecting the length of the holder. Indeed, *Mattsson* does not explicitly mention a holder at all.

The rejections of Claims 8, 9, and 15 all rely on the assumption that the antenna-receiving member of *Chen* is a waveguide. As submitted above, this is incorrect. However, even if the antenna-receiving member is a waveguide, *Chen* does not teach a holder in which the end of the holder opposite the “waveguide” is closed, *see* Fig. 1, as required by Claim 8. *Chen* also fails to teach a holder that is detachably attached to the “waveguide,” as required by Claim 15.

Claim 13 describes an arrangement “wherein the holder comprises small openings at the keys of the radio device to be tested”. The Office Action indicates that *Chen* discloses this

feature at paragraphs [0057] and [0058]. However, the holders depicted in *Chen* are completely open, with no enclosure in which to leave “small openings”. When *Chen* does briefly mention a holder that is partially enclosed, no provision is made for openings over the keys. *Chen* at [0027].

In the rejection of Claim 21, the Office Action indicates that *Mattsson* discloses calibrating the test equipment “by means of a reference unit having a grounded antenna circuit” at col. 5 lines 6-22. The cited text describes a calibration procedure, in which the reference unit measures the strength of a signal and sends the result to a computer. It could not, therefore, have a grounded antenna circuit. On the other hand, the reference unit of Claim 21 is completely passive, and the calibration process involves reflecting signals from the reference unit’s grounded antenna circuit.

Still further, *Mattsson* does not teach the use of only one coupling for wideband measurements. The solution disclosed in *Mattsson* requires the use of two couplings, as illustrated by Fig. 6. As a consequence, the solution of *Mattsson* can only operate on narrow frequency bands, each of which is associated with one coupling. This cannot achieve the same wideband mode of propagation as the claimed invention, where one coupling is sufficient. Enabling use of one coupling through wideband capability simplifies the testing arrangement considerably, and makes the measurements consistent, because the use of multiple couplings induces greater fluctuation in the measurement results. Stated differently, the use of bevels in ridges increases the bandwidth of the propagation mode, thereby resulting in higher operating bandwidth than that suggested in *Mattsson*.

Applicants respectfully note that in order to support a claim of *prima facie* obviousness, the cited references must teach or suggest each and every element of the invention, and there must be a basis to combine the references and prior art as suggested. However, nothing in the art of record would teach or suggest, either alone or in combination, each of the elements recited in

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Claims 1 and 17, as currently amended.

Applicants respectfully submit that Claims 2-16 and 18-23, which ultimately depend from Claims 1 and 17, respectively, are patentable over the art of record by virtue of their dependence. Further, Applicants submit that Claims 2-16 and 18-23 define additional patentable subject matter in their own right. Therefore, it is respectfully requested that the rejection of Claims 1-23 under 35 U.S.C. §103(a) be reconsidered and withdrawn.

Conclusion

Entry of the amendments to Claims 1 and 17; favorable consideration of Claims 1 and 17, as amended; and allowance of pending Claims 1-23 are respectfully solicited.

In view of the foregoing remarks, this application should now be in condition for allowance. A notice to this effect is respectfully requested. If the Examiner believes, after these remarks, that the application is not in condition for allowance, the Examiner is requested to call the Applicants' attorney at the telephone number provided below to discuss any outstanding issues.

Respectfully submitted,

/rod s. turner/
Rod S. Turner
Registration No.: 38,639
Attorney for Applicants

HOFFMANN & BARON, LLP
6900 Jericho Turnpike
Syosset, New York 11791
(516) 822-3550
RST:jp